NIOSH FACT SHEET

The National Institute for Occupational Safety and Health (NIOSH) is the federal agency responsible for conducting research and making recommendations for the prevention of work-related disease and injury. NIOSH is part of the Centers for Disease Control and Prevention (CDC).

Recommendations to Protect Laboratory and Field Workers From West Nile Virus Exposure




Introduction

Disease:

The West Nile Virus (WNV) is spread by mosquitoes to birds and other animals through a mosquito bite. The virus normally passes between mosquitoes and birds. However, people may also be infected if they are bitten by a WNV-infected mosquito.

The most likely route of WNV infection to humans is through the bite of an infected mosquito. WNV may also be transmitted by organ transplantation, blood transfusion, or possibly breast milk [CDC 2002a,b]. Transplacental (mother-to-fetus) infection has occurred [CDC 2002c]. Workers are at risk of WNV infection if their skin is penetrated or cut while handling WNV-infected tissues [CDC 2002d]. Turkey breeder farm workers have been infected with WNV [CDC 2003]. The mode of transmission to these farm workers is unknown.

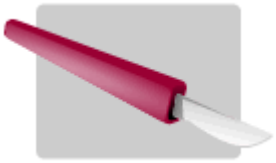
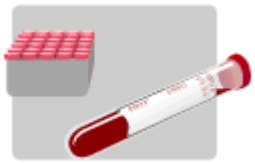
Most human infections cause either mild flu-like symptoms or no symptoms at all. Mild symptoms may include fever, fatigue, headache, and muscle or joint pain. Although rare, some people may become severely ill. Severe symptoms may include high fever, stiff neck, disorientation, tremors, muscle weakness, and paralysis. Severely affected persons may develop encephalitis, meningitis, or meningoencephalitis—inflammation of the brain, membranes of the brain or spinal cord, or both, respectively. Severe cases may be fatal. Persons over the age of 50 are at higher risk of severe illness.

History:

From 1999 to 2001 in the United States, 149 cases of illness and 18 deaths due to WNV were reported in humans. In 2002, more than 4100 cases and more than 280 deaths in humans due to WNV were reported by State health departments to the Centers for Disease Control and Prevention (CDC). In 2003, as of October 22, more than 7300 cases and 155 deaths have been reported.

Location:

WNV is commonly found in Africa, West Asia, and the Middle East. It was first reported in the United States in New York State in 1999. In 2002, WNV was detected in 44 continental states, including the District of Columbia. Human cases were reported in 39 states and the District of Columbia. The geographic range of WNV has expanded annually.


Occupational Risk

The most likely way persons become infected with WNV is through the bite of an infected mosquito. Therefore, persons working outdoors when mosquitoes are actively biting are at risk of infection (link to NIOSH Fact Sheet: Recommendations to Prevent West Nile Virus Infection in Outdoor Workers). Aside from outdoor workers, workers in many other occupations are at potential risk of exposure to WNV-infected humans, animals, or their blood or other tissues. Workers at risk include laboratory diagnosticians, researchers, and technicians, veterinarians and their staff, wildlife rehabilitators, ornithologists, wildlife biologists, pathologists, zoo and aviary curators, health care workers, emergency response and public safety personnel, public health employees, and workers in related occupations. For example, workers are at risk of WNV infection if their skin is penetrated or cut while performing necropsies or handling WNV-infected tissues or fluids [CDC 2002c]. Turkey breeder farm workers have been infected with WNV [CDC 2003]. The mode of transmission to these farm workers is unknown.



Recommendations for laboratory and field workers

Outdoor workers may be at increased risk of WNV infection and should be educated about this occupational health issue and available recommendations (link to NIOSH Web Site Fact Sheet: Recommendations to Prevent West Nile Virus Infection in Outdoor Workers).

The following recommendations are for both the laboratory and field workplaces in which transmission of WNV may occur by means other than mosquito bite. Until further studies determine the risk of WNV infection from exposure to infected persons, animals, fluids, or tissues, it is prudent public health practice to minimize such potentially infectious contacts. These are basic recommendations to reduce exposure to blood and other tissues from WNV-infected cases. More stringent protective equipment and work practices should be used when warranted. Biosafety guidelines are available for working with WNV and other microbiological agents in the laboratory [CDC 1999].

Recommendations for employers

- Provide training that describes how WNV is transmitted and reinforces the potential risks of WNV exposure and infection.
- Provide appropriate personal protective equipment that provides barrier protection including gloves, gowns, safety glasses, and/or face shields.
    - Alternatives to powdered latex gloves should be provided.
- Stress to employees the importance of timely reporting of all injuries and illnesses.
- Provide a medical surveillance system that monitors, records, and assesses:
    - symptoms consistent with WNV infection
    - laboratory incidents or accidents involving possible WNV exposure
    - employee absenteeism.

Recommendations for workers

- Use personal protective equipment that provides barrier protection including gloves, gowns, safety glasses, and/or face shields to avoid dermal and mucous membrane contact with blood and other tissues.
    - Workers conducting necropsies should wear gloves that prevent cutting injuries, such as stainless steel mesh gloves, in addition to medical examination gloves.
- Wash hands and other skin surfaces with soap and water immediately after contact with blood or other tissues, after removing gloves, and before leaving the workplace.
- Minimize the generation of aerosols.
- Handle sharp instruments carefully during use.
- Use medical devices with safety features when available to avoid sharps-related injuries.
- Avoid recapping needles.
- Dispose of sharp instruments carefully after use.
- Report all needlestick and other sharps-related injuries to the supervisor.
- Report to the supervisor any laboratory incidents or accidents involving possible WNV exposure.
- Report to the supervisor any symptoms consistent with WNV infection.

For more information on biosafety, link to "Biosafety in the Laboratory", a CDC Office of Health and Safety presentation:
http://www.cdc.gov/od/ohs/pdffiles/Module%202%20-%20Biosafety.pdf

What precautions should be taken if handling dead animals?

Anyone handling dead animals should wear gloves. Appropriate gloves provide a protective barrier that prevents blood and other body fluids from passing through them. Medical examination gloves are recommended. Cotton, leather, and other absorbent glove materials are not protective. If latex gloves are used they should be reduced protein, powder-free gloves to reduce workers' exposure to allergy-causing proteins.

What should a worker do who suspects he or she has been infected with WNV?

Any laboratory incidents or accidents involving possible WNV exposure should be immediately reported to the supervisor. Any worker who has health concerns should contact his or her health care provider. If the worker is at risk of WNV exposure and shows signs of possible WNV infection, the health care provider may submit a biological sample for WNV testing.

Mild symptoms of WNV infection include fever, fatigue, headache, and muscle or joint pain. Severe symptoms include high fever, stiff neck, disorientation, tremors, muscle weakness, and paralysis. The incubation time from mosquito bite to clinical symptoms is reported to be from 3 to 15 days. No specific treatment exists for WNV infection. Treatment consists of supportive care for the individual. Currently, no approved vaccine exists to prevent WNV infection in humans.

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